

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in this application.

Listing of Claims:

1. (Currently amended) A centrifugal fan impeller (1) having an axis of rotation (6) and comprising one or more modules (2), comprising a mounting disc (4), at least one connecting ring (5) and a plurality of blades (3) extending between the mounting disc (4) and the connecting ring (5), the blades (3) being connected to the disc (4) and ring (5) at an angle (α) relative to the axis (6) of the impeller (1), the impeller being characterised in that the angle (α) at which the blades (3) are inclined is 10 degrees, in that the connecting ring (5) is positioned on an outer diameter in respect to the blades (3), whereby the inner part of the mould for producing the fan impeller (1) can be extracted axially from both sides of the fan impeller (1),

in that the profile of each blade (3) at ~~[[the]]~~ a root thereof is inclined at an angle (γ_1) ranging from 50 to 80 degrees,

and in that the profile of each blade (3) at ~~[[the]]~~ an end thereof is inclined at an angle (γ_2) ranging from 33 to 63 degrees, said angles (γ_1 , γ_2) at the root (7) and at the end (8) of the blade (3) being defined as the angles made by the profile of the blade (3), at the root and end of the blade respectively, with respect to an impeller radius (R1, R2) passing through the leading edge ~~[[the]]~~ (A) of the profile.

2. (Previously presented) The impeller according to claim 1, characterised in that each blade (3) is substantially trapezoidal in shape when seen in a straightened plan view.

3. (Previously presented) The impeller according to claim 1, characterised in that each blade (3) is

substantially rectangular in shape when seen in a straightened plan view.

4. (Previously presented) The impeller according to claim 2, characterised in that each blade (3) has a straight leading edge (A) inclined at an angle (β) ranging from 0 to 40 degrees with respect to the axis (6) of the impeller (1).

5. (Previously presented) The impeller according to claim 2, characterised in that each blade (3) has a straight trailing edge (U) parallel to the axis (6) of the impeller (1).

6. (Previously presented) The impeller according to claim 2, characterised in that each blade (3) has a straight leading edge (A) inclined at an angle (β) of 12.65 degrees with respect to the axis (6) of the impeller (1).

7. (Previously presented) The impeller according to claim 1, characterised in that the profile of each blade (3) at the root is inclined at an angle (γ_1) of 65.2 degrees.

8. (Previously presented) The impeller according to claim 1, characterised in that the profile of each blade (3) at the end is inclined at an angle (γ_2) of 48.2 degrees.

REMARKS/ARGUMENTS

Claims 1 – 8 are presented for reconsideration and further examination in view of the foregoing amendments and following remarks.

In the outstanding Office Action, the Examiner objected to claim 1 due to informalities; rejected claims 1, 2 and 4 – 8 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,611,667 to Nagamori et al. (hereinafter referred to as “the Nagamori et al. ‘667 patent”); and rejected claims 1, 3, 7 and 8 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,158,954 to Nabeshima et al. (hereinafter referred to as “the Nabeshima et al. ‘954 patent”).

By this Response and Amendment, claim 1 has been amended to correct informalities; and Applicant has traversed the prior art rejections:

It is respectfully submitted that no new matter has been introduced to this application within the meaning of 35 U.S.C. § 132. The amendments to claim 1 are not narrowing but cosmetic and have not been made to overcome any prior art reference.

Objection to the Claims

The Examiner objected to claim 1 due to informalities. Specifically, the Examiner indicated that there is insufficient antecedent basis for the phrases “the root,” and “the end” in claim 1. Also, the Examiner indicated that “(4)” in claim 1, line 22 should be changed to – (U) –.

Response

By this Response and Amendment, claim 1 has been amended such that antecedent basis is provided for the cited phrases. With respect to amending claim 1 to replace “(4)” in line 22 to – (U) –, Applicant notes that the “leading edge,” the feature to which “(4)” refers, is referenced in the originally filed specification at page 4, lines 6 – 9 as – A –. Thus, claim 1 has been amended to

replace “(4)” in line 22 with – (A) – rather than – (U) –, which refers to a “trailing edge.”

Accordingly, reconsideration and withdrawal of the objection are respectfully requested.

Rejections Under 35 U.S.C. §103(a)

1. The Nagamori et al. ‘667 Patent

The Examiner rejected claims 1, 2 and 4 – 8 as being unpatentable over the Nagamori et al. ‘667 patent.

Response

By this Response and Amendment, Applicant respectfully traverses the Examiner’s rejection since all of the features of the presently claimed invention are not disclosed, taught or suggested by the cited prior art. To establish a *prima facie* case of obviousness, the Examiner must establish that the prior art references teach or suggest all of the claim limitations. *Amgen, Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 USPQ 494, 496 (CCPA 1970).

Independent claim 1 recites “[a] centrifugal fan impeller..., the impeller being characterised in that the angle (α) at which the blades (3) are inclined is 10 degrees... in that the profile of each blade (3) at a root thereof is inclined at an angle (γ_1) ranging from 50 to 80 degrees, and in that the profile of each blade (3) at an end thereof is inclined at an angle (γ_2) ranging from 33 to 63 degrees....”

The Nagamori et al. ‘667 patent discloses “a transverse fan” having a plurality of blades circumferentially disposed between disk- or ring-shaped end plates. The Nagamori et al. ‘667 patent does not disclose a particular angle in which the blades should be positioned; rather, the Nagamori et al. ‘667 patent merely discloses that the blades should or should not be parallel with respect to each other. *See The Nagamori et al. ‘667 Patent* at col. 7, lines 20 – 27.

In contrast to the presently claimed invention, the Nagamori et al. '667 patent does not disclose, teach or suggest "[a] centrifugal fan impeller..., the impeller being characterised in that the angle (α) at which the blades (3) are inclined is 10 degrees... in that the profile of each blade (3) at a root thereof is inclined at an angle (γ_1) ranging from 50 to 80 degrees, and in that the profile of each blade (3) at an end thereof is inclined at an angle (γ_2) ranging from 33 to 63 degrees..." as recited in claim 1. As the Examiner acknowledges in the Office Action, the cited Nagamori et al. '667 patent is silent with respect to such detailed characterization of the geometry of the impeller fan blades. As such, the Examiner needs to either 1) provide a secondary reference disclosing these angles; or 2) show that angles of the presently claimed invention would have been easily discovered by a person of ordinary skill in the art in view of the Nagamori et al. '667 patent. Since all of the features of the presently claimed invention are not disclosed, taught or suggested by the cited prior art, Applicant submits that the Examiner has not made a *prima facie* case of obviousness of the presently claimed invention in view of the prior art.

Applicant notes the Examiner's comment at page 4 of the Office Action that "Applicant has not disclosed that having such an impeller [as claimed] provides an advantage." On the contrary, according to the specification, the impeller does provide an advantage, namely the inclined blades offer top performance in terms of pressure head and capacity, while being easy to construct and have low noise. Further, Applicant notes on page 7 of the originally filed specification where the frequencies of the sound pressure level are discussed as being advantageous to the human ear. Applicant submits that these advantages were discovered by the inventors of the presently claimed invention and would not have been obvious to a person having ordinary skill in the art.

If the Examiner persists in his obviousness rejection, Applicant submits that the Examiner is taking Official Notice of the obviousness of the angular orientation of impeller blades. As such,

Applicant respectfully requests that the Examiner provide evidentiary support for his assertion that the particular angles of the fan impeller blades that are recited in the claim would have been obvious to a person having ordinary skill in the art in view of the Nagamori et al. '667 patent.

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the outstanding rejections.

2. The Nabeshima et al. '954 Patent

The Examiner rejected claims 1, 3, 7 and 8 as being unpatentable over the Nabeshima et al. '954 patent.

Response

By this Response and Amendment, Applicant respectfully traverses the Examiner's rejection since all of the features of the presently claimed invention are not disclosed, taught or suggested by the cited prior art. To establish a *prima facie* case of obviousness, the Examiner must establish that the prior art references teach or suggest all of the claim limitations. *Amgen, Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 USPQ 494, 496 (CCPA 1970).

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The Nabeshima et al. '954 patent discloses a cross-flow fan and an air-conditioner using it. The fan has a number of vanes that are disposed in a peripheral direction of supporting disks disposed along a rotary shaft. Each vane is at an angular interval.

In contrast to the presently claimed invention, the Nabeshima et al. '954 patent does not disclose, teach or suggest "[a] centrifugal fan impeller..., the impeller being characterised in that the angle (α) at which the blades (3) are inclined is 10 degrees... in that the profile of each blade (3) at a root thereof is inclined at an angle (γ_1) ranging from 50 to 80 degrees, and in that the profile of each blade (3) at an end thereof is inclined at an angle (γ_2) ranging from 33 to 63 degrees..." as recited in claim 1. As the Examiner acknowledges in the Office Action, the cited Nabeshima et al. '954 patent is silent with respect to such detailed characterization of the geometry of the impeller fan blades. As such, the Examiner needs to either 1) provide a secondary reference disclosing these angles; or 2) show that angles of the presently claimed invention would have been easily discovered by a person of ordinary skill in the art in view of the Nabeshima et al. '954 patent. Since all of the features of the presently claimed invention are not disclosed, taught or suggested by the cited prior art, Applicant submits that the Examiner has not made a *prima facie* case of obviousness of the presently claimed invention in view of the prior art.

Applicant notes the Examiner's comment at page 4 of the Office Action that "Applicant has not disclosed that having such an impeller [as claimed] provides an advantage." On the contrary, according to the specification, the geometry of the impeller of the presently claimed invention does provide an advantage, namely the inclined blades offer top performance in terms of pressure head and capacity, while being easy to construct and have low noise. Further, Applicant notes on page 7 of the originally filed specification where the frequencies of the sound pressure level are discussed as being advantageous to the human ear. Applicant submits that these advantages were discovered by the inventors of the presently claimed invention and would not have been obvious to a person having ordinary skill in the art.

If the Examiner persists in his obviousness rejection, Applicant submits that the Examiner is

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taking Official Notice of the obviousness of the angular orientation of impeller blades. As such, Applicant respectfully requests that the Examiner provide evidentiary support for his assertion that the particular angles of the fan impeller blades that are recited in the claim would have been obvious to a person having ordinary skill in the art in view of the Nabeshima et al. '954 patent.

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the outstanding rejections.

CONCLUSION

In light of the foregoing, Applicant submits that the application is now in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicant respectfully requests that the Examiner contact the undersigned attorney if it is believed that such contact will expedite the prosecution of the application.

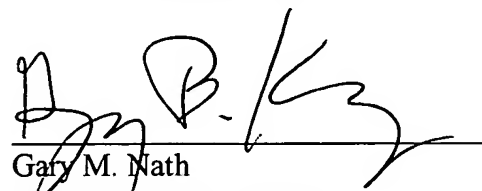
In the event this paper is not timely filed, Applicants petition for an appropriate extension of time. Please charge any fee deficiency or credit any overpayment to Deposit Account No. 14-0112.

Respectfully submitted,

NATH & ASSOCIATES PLLC

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